

# New and Interesting Facts from Science and Life

## FIRST AID Methods of REVIVING the DROWNING

**D**URING the bathing season each year a great number of lives are needlessly lost by drowning. The victims are usually rescued from the water while life still remains, but the feeble vital spark is permitted to flicker out in too many cases simply because the rescuers do not know the principles of "first aid" to the drowning.

Physicians and life-guards are most emphatic in their statement that every one not only should learn to swim, but he should at the same time learn how to rescue drowning persons and how to restore them to consciousness.

Some recent vital statistics will make this point clear. In the state of New York last month 58 bathers were taken from the water apparently dead. Of these victims only some 12 or 15 were resuscitated. It was estimated that as many as 75 per cent. of remaining victims were permitted to die because the rescuers of the apparently dead bodies did not know how promptly and efficiently to apply the methods of producing artificial respiration in the drowning.

Mechanical devices for this purpose are not essential, although there has been recently perfected a wonderful but simple machine for the purpose, called the "lung-motor."

There are several methods of performing artificial respiration, but two of the most effective manual methods are the Schaeffer method and the Silvester method, according to a United States government bulletin. The following description of how the Schaeffer method is taught and applied was prepared by a commission on resuscitation, representing the American Medical Association:

Remove the victim to fresh air as quickly as possible. Rapidly feel with the finger in his mouth and throat and remove any foreign body

(tobacco, false teeth, etc.); then begin artificial respiration at once. Proceed as follows: Lay the subject on his stomach, with the arms extended as straight forward as possible and with the face to one side, so that his nose and mouth are free for breathing. Let an assistant draw forward the subject's tongue.

Kneel straddling the subject's thighs and facing his head; rest the palms of your hands on his loins (on the muscles of the small of the back), with the fingers spread over the lowest ribs.

With arms held straight, fingers forward, slowly swing forward so that the weight of your body is gradually and without violence brought to bear upon the subject. This act should take two to three seconds. Then immediately swing backward so as to remove the pressure, returning to the first position. Repeat regularly 12 to 15 times per minute the swinging forward and backward, completing a respiration in four or five seconds.

As soon as this artificial respiration has been started and while it is being conducted an assistant should loosen any tight clothing about the subject's neck, chest or waist. Continue the artificial respiration without interruption until natural breathing is restored or, if necessary, two hours or longer; or until a physician arrives and takes charge. If natural breathing stops after having been restored, use artificial respiration again.

Do not put any liquid in the patient's mouth until he is fully conscious.

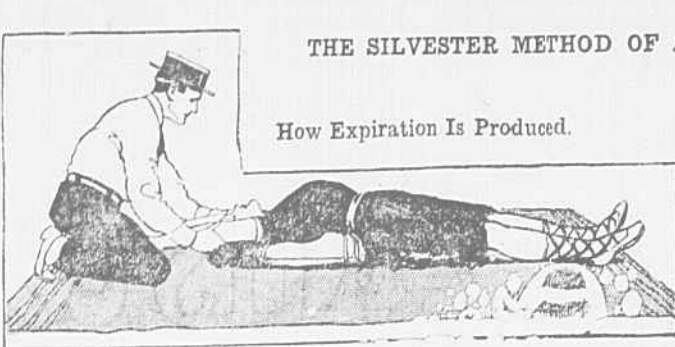
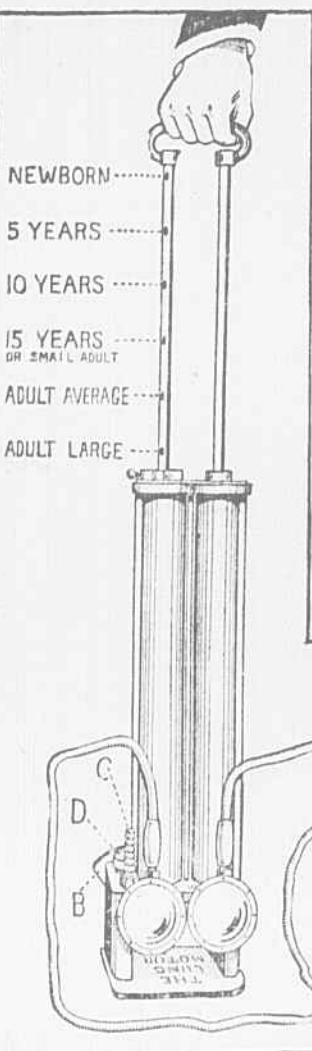
Give the patient fresh air, but keep him warm.

Send for the nearest doctor as soon as the accident is discovered.

The following procedure is used to produce artificial respiration by the Silvester method:

Place the victim on his back, fold

## How SCIENCE'S Mechanical and Manual MEANS PREVENT Needless LOSS of LIFE



THE SILVESTER METHOD OF ARTIFICIAL RESPIRATION.

How Expiration Is Produced.

How Inspiration Is Produced.

THE LUNG MOTOR.

An Upward Movement of the Handle, the Length of Which Is Determined by the Victim's Age, Fills the Pressure Chamber with Fresh Air and the Suction Cylinder with Expired Air from the Victim's Lungs. A Downward Movement of the Handle Forces the Air from the Pressure Cylinder into the Lungs of the Subject and Expels into the Open the Expired Air of the Suction Cylinder.

a blanket or coat, and put it under his shoulders so as to throw the chest forward.

Press open his mouth, grasp his tongue, draw it forward and let an assistant hold it or tie it out with a gauze bandage or a shoestring, or tie a handkerchief into strips and tie them together, thus making a string. Place the bandage or string over the tongue, draw the ends down, one on either side of the jaw, crossing them underneath the chin, and bring back one end to each side of the head. Tie the ends on top of the head. This action holds the tongue forward. In an emergency,

the tongue can be held forward with a safety pin.

Emergency kits contain an oral screw with which to force open the jaws, a pair of tongue forceps for grasping the tongue and drawing it forward, a glass tube in which there is a curved needle, and a sterile catgut thread. In case of emergency, the first-aid man can run the needle and thread through the tongue and thus hold it out.

After getting the tongue out, kneel by the patient's head, grasp both arms just below the elbows and draw them upward and backward toward you as far as they will go. This action

draws air to enter the lungs, thus producing inspiration. Then also the arms and bring them inward and downward to the chest, applying pressure sufficient to expel the air, thus producing expiration. These movements should be performed at the rate of 16 to 18 times per minute.

As soon as signs of life appear the lower limbs should be elevated and rubbed vigorously toward the heart. Hot applications should be used over the heart if practicable.

IF THERE IS NO SIGN OF LIFE, KEEP UP THE ARTIFICIAL RESPIRATION FOR AT LEAST TWO HOURS, AS THE PATIENT MAY BE BREATHING, ALTHOUGH NOT APPEARING TO BE DOING SO. SOME PATIENTS HAVE BEEN REVIVED AFTER SEVERAL HOURS OF HARD WORK.

If the patient remains unconscious and is able to swallow, give hot coffee or half teaspoonful doses of aromatic spirits of ammonia.

Various types of mechanical devices have been invented for reviving suffocated and strangled persons. One machine, called the "lung-motor," is said to restore normal breathing because it mechanically supplies the tidal volume of air each respiration, that is, a quantity of air equal to that which the patient would breathe while at rest, yet not so much as to injure the tissues of

the lungs and the circulation, thus not leaving the subject susceptible to pneumonia.

It is also claimed that this device is suitable for persons of all ages and correspondingly varying lung capacities. It is equipped with adjustments for supplying the different air volume of the newborn, 5, 10 and 15-year-old children and small, average and large adults.

The lung-motor consists of two air-pumps connected to a common handle. The construction is such, however, that there is no interchange of air between the pumps, so that at no time does the devitalized air come into contact with the fresh air or oxygen.

The operation of the device is very simple. An upward movement of the handle fills the pressure cylinder with air or oxygen—the latter if the small, self-contained oxygen generator, which is a part of the machine, is employed—or a mixture of both, according to the setting of the air and oxygen valve. At the same time the suction cylinder is filled with the expired air drawn from the lungs of the patient. The downward movement of the handle and piston forces the air, now contained in the pressure cylinder, into the lungs of the subject and discharges into the open the expired air of the suction cylinder.

Besides drowning, suffocation by gas is a very common accident. As in cases of drowning, first aid to the gas victim consists of instant and efficient means of producing artificial respiration by the manual or mechanical methods described.

In cases of poisoning by gas, a high percentage of oxygen in the air inhaled by the victim is more important than the extent to which the lungs are filled or emptied by mechanical means. Gas poisons by combining with the red coloring matter of the blood and thus preventing the blood from carrying the necessary amount of life-saving oxygen to the tissues of the body. A victim of gas poisoning can be revived if the gas that his blood has absorbed can be replaced by oxygen.

Ordinary air is only about one-fifth oxygen, the blood can absorb five times as much oxygen when a man breathes pure oxygen as when he breathes ordinary air. For this reason oxygen, if obtainable, should be given in the manner already stated; that is, by a breathing bag properly connected to a source of supply and a face mask having suitable valves. In case a man cannot breathe, the Schaeffer or Silvester method of artificial respiration should be used to cause the oxygen to enter the lungs.

## Why a Soldier's BRAVERY DEPENDS Upon His TEETH

**A** Army's efficiency is measured by the soundness of its teeth.

The teeth of men of today are not nearly so good as were those of the men who fought two or three generations ago, according to an authority on the science of dentistry who points out that the soldiers of the Peninsula and Waterloo never seemed to have been troubled with bad teeth—a fact probably due to the class from which they were drawn.

"It is a mere commonplace," says this writer, "that countrymen have better teeth than dwellers in towns, and young men than the middle-aged, and the rank and file of armies in that far-off time were peasants in the prime of life. That is to say, they were brought up from infancy on abundance of milk, a sufficiency of home-made bread, and very little meat, while tea and sugar were in their day luxuries reserved for the well-to-do. Hence Wellington's soldiers, for instance, were able to masticate the tough meat, either freshly killed or salted and always very imperfectly cooked, and the stone-hard army biscuits served out to them, with no trouble to themselves and possibly—although the point is by no means well settled—with great advantage to their dentition."

"Now, however, things are entirely altered. Used from the shedding of our milk teeth to meat every day and a diet in which sugar plays a prominent part, few of us get to the age of 40 without losing several teeth of the second crop, while those that are left require constant attention from a skilled practitioner in the shape of filling and so on, if their decay is to be arrested, and they are to prove useful servants to us in our old age. Men who are a long way under 40 are, therefore, frequently refused admission to the army on the ground of defective teeth; and even with those who are accepted constant care by a skilled dentist is found to be necessary if they are to remain effective. How is this aid to be rendered?"

"That it is worth while from the military point of view to render it there can be little question. Although the tooth brush now forms part of the private soldier's regular kit, opportunity for its use when actually at the front is uncommonly rare. Hardly meals, a large ration of sweet food and an abundance of meat all go to making the soldier's teeth extraordinarily liable to caries or decay and the evil consequences of this are manifold. The pain of

toothache alone will do something to shake the soldier's nerve, while the consequent loss of sleep and the difficulty in masticating his food will aggravate the ill-effects of the lack of sleep. In bad cases pyorrhea, with the rheumatism and septicemia which are its most ordinary

## Telegraph CODE for BOY SCOUTS

**A** TELEGRAPH code which can be learned in a few minutes and which is composed entirely of dots has been devised by a railroad man who believes that it has great possibilities as an emergency code.

To learn the system it is only necessary to write down the alphabet in its usual order, placing six letters to a line; A to F, inclusive, will constitute the first line; G to L, inclusive, the second line, and so on; the fifth line will be composed of Y and Z only.

The dots for each letter are ascertained by numbering each with two numerals; first a numeral indicating the group to which the letter belongs and second its position in that group. Thus A is 1-1, B is 1-2, C is 1-3 and so on, to F, 1-6. The second group is

consequences, will probably come to toothache. Moreover, as none but the sufferer himself can tell whether a man really has toothache or not, it is one of the complaints for which he is likely to get the least sympathy from his comrades and little consideration from the over-worked regimental surgeon. In a few

## Automobiles for Gypsies.

**E**VEN gypsies are abandoning horses for motors. A band of about 40 of these nomads recently visited Columbus, O., traveling in three covered automobiles which had been purchased a short time before.

The leader of the gypsies said that the cost of the cars ranged from \$750 to \$2000. Each motor was fitted up in true gypsy fashion, and portions of the tops were painted in the bright colors characteristic of gypsy wagons.

## Making MIRRORS by ELECTRICITY

**A** RAPID and admirable method for depositing suitable metals on the surface of glass so as to produce mirrors consists of decomposing the metal by means of a high potential electric current. It is thus described in the *Physikalischer Zeitschrift* by G. Rumelin.

A metal plate is placed in juxtaposition with the glass plate which is to receive the coating. The two plates are then placed flat on a table beneath the receiver of an air-pump suitable for producing a high degree of vacuum, such, for example, as the rotary pump of Gaede.

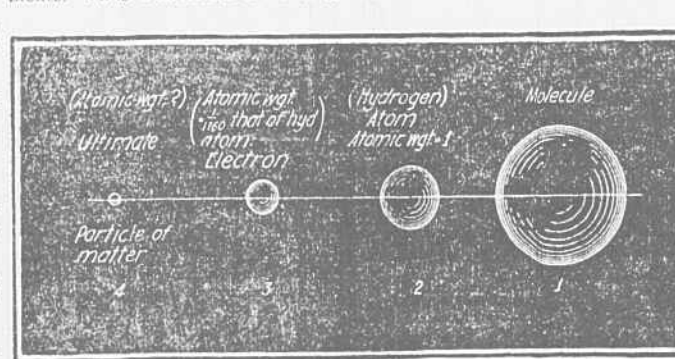
A small quantity of an inert gas, such as hydrogen, is introduced into the vacuum and a high potential current is then turned on by means of the negative pole of a suitable source of electricity, this pole being attached to the metal plate. Thirty

seconds duration of this cathodic flow is sufficient to obtain a properly silvered mirror.

Besides silver the metals gold, copper, platinum, nickel, iron, palladium and iridium may be employed.

## The SMALLEST Quantity of MATTER

**F**OR a long time the atom was spoken of as being the smallest thing in the world, so small, indeed, that it could not be seen with the most powerful magnifying glass. A molecule is the smallest part of any material. It is supposed to be made up of atoms of various elements. Thus a molecule of water is



Showing Disintegration of Molecule Into Atoms, Thence Into Electrons, and Then Into the Ultimate Particles of Matter.

made up of one atom of oxygen and two atoms of hydrogen.

Now we hear that the atom may be broken up into fragments called ions.

The ion is both the smallest quantity of matter and the smallest quantity of electricity capable of existing in a free state. It is so small that if enough electricity to generate the hydrogen in a toy balloon were to be obtained by counting out the ions, 100 to the minute, the task would oc-

cupy 100,000,000 persons 4,000,000 years, according to scientists. And yet these ions have been isolated and measured in the laboratory of Prof. R. A. Milliken, of the University of Chicago. Prof. Milliken has modified and improved upon the methods of previous experimenters who used for their experiments a

## The FOOD VALUE of FROZEN and DRIED EGGS

**T**HE frozen and dried egg industry, declares a new publication of the department of agriculture, is a permanent one because it meets a distinct economic need.

Many eggs which could not stand long shipments may be preserved as wholesome food by freezing them out of the shell or by drying. In the beginning, however, there was a natural popular prejudice against the business, which was increased by the ignorance and carelessness of some of the pioneers. It was under these conditions that the department of agriculture undertook a study of the problem in order to lay the ground-work for a scientific preparation of an extremely perishable product.

Some of the results of this study have been published in a bulletin. The eggs commonly used for breakfast are small or undersized eggs and dirty, cracked, or shrunken eggs. To the trade these are known as "seconds." They are not to be confused with eggs that are unfit for human use, such as the classes known as black, white, mixed and sour rots, green whites, eggs with stuck yolks, musty and moldy eggs, blood rings, etc. These should be rejected entirely or else used for tanning purposes only. Eggs with a bad odor should be rejected absolutely.

Careful candling before the eggs go to the breaking room is one of the principal points upon the importance of which the new bulletin insists. This is not only necessary to prevent the use of unfit eggs, but it will also prevent the waste of a number of perfectly good eggs which might otherwise be rejected.

In order to insure that the eggs are well candled, the bulletin recommends some system by which the work of the individual candler may be checked. Eggs that are found difficult to grade should be set aside by the regular candlers for examination by an expert. Furthermore, the eggs should be graded again when out of the shell, for certain kinds of infection can only be detected when the eggs have been broken. When grading eggs out of the shell, only two grades should be recognized—food eggs and tanner's eggs.

The production of frozen and dried eggs is primarily an industry for the egg-producing sections. Many eggs that now reach the large consuming markets in a totally unfit condition could be saved, it is pointed out, and a large portion of the annual waste eliminated if they were treated in time.

## Why You LATHER Before SHAVING

**W**HY does lathering the face make shaving easier? The many answers to this question from scientists and from laymen are equally interesting. Here is one explanation given by a writer in one of the scientific magazines:

"When a barber applies a heavy coat of lather to a long beard the lather tends to hold the hair upright. In the first shaving the microscope shows that the cuttings are nearly at a right angle to the length of the beard, but the 'second time over,' when the call is for 'a close shave,' short, rapid strokes are made, several times repeated. When the lather is off the barber will occasionally wet his fingers, because the face gets too dry. Indeed, there is nothing to maintain the perpendicularity of the beard. It bends over and the barber rapidly whacks away at it like the bushman grubbing bushes. The

## Why You LATHER Before SHAVING

following is the explanation of another writer, who says that lathering is a roundabout way of lubricating the face with water:

"Lathering has the effect, when properly done, of reducing the bulk of the soap and increasing the number of bubbles whereby water is kept in close apposition to the skin by the surface tension.

"This is a roundabout way of using water as a lubricant for the efficient and easy passage of the razor across the skin, but once the lubricating qualities of water are recognized as of value in such circumstances it is but a short step to applying the water direct and shaving while the skin is well soaped.

"This is the method long in use by the orientals, and is one that can be thoroughly recommended for trial. 'Apart from its economy, the skin is not so liable to irritation, the edge of the razor is not so easily dulled, while the whole operation is completed in half the time.'"

## KILLING the "KICK" in a GUN

**M**OST people know that when an ordinary rifle is fired it "kicks," and, indeed, may knock a man down unless he holds the rifle butt close to his shoulder. It can be imagined, therefore, what a gigantic "kick" a big field gun can give!

It has always been one of the problems to solve in firing these big guns, how to control the recoil. If it were not controlled the gun would jump back a distance up to 50 yards, not only probably smashing itself up, but killing the gunners as well.

Springs and air chambers, of course, have been used, but it was found that they got out of order.

The Germans have found the best method of overcoming the recoil. Early in the war one of the big German guns was captured by the English and brought to Woolwich Ar-

senal for a thorough examination. It was found that instead of using compressed air the special recoil chambers were filled with a compound, which glycerine was the chief ingredient.

## Rambling Route of the BEE

**A**CCORDING to a well known apiculturist, if a bee finds a suitable patch of flowers by following a zig-zag course of exploration, it will seek it again by the same devious route, and not in a straight line from the nest. Thus he found that certain bees coming to visit a hollyhock in his garden always came over the wall some 25 yards to one side of the flower instead of directly opposite. They were following the devious route by which they had first found the flower.